



Technical Memorandum

To: Karen Jurist, USEPA, Region 9
From: Don Gruber, Senior Hydrogeologist, Gilbane
Date: March 20, 2015
Subject: Groundwater Monitoring Results, March/August 2014, Southern Avenue Industrial Area Superfund Site Remedial Investigation/Feasibility Study, South Gate, California
Contract / TO: EP-S9-08-03/TO 63 **ITSI DCN:** 07163.0064.0035

This technical memorandum documents results from the groundwater sampling activities conducted at the Southern Avenue Industrial Area (SAIA) Superfund Site (Site), South Gate, Los Angeles County, California, in March and August 2014. Sampling activities were conducted as part of the remedial investigation/feasibility study (RI/FS) at SAIA and implemented in accordance with the *Final Sampling and Analysis Plan, Remedial Investigation/Feasibility Study, Southern Avenue Industrial Area Superfund Site, South Gate, California* (ITSI Gilbane, 2012).

A network of existing and newly installed monitoring wells was sampled during the March and August 2014 events (Figure 1). The March 2014 event included sampling of 20 new wells and eight existing wells. The August 2014 event only included sampling of the 20 new wells that were installed at the site between February 18 and March 5, 2014. This technical memorandum provides a preliminary evaluation of the new groundwater data to assess any potential data gaps prior to preparation of the Remedial Investigation Report. Data collected will be used to assess the magnitude of remaining on-site sources and the extent of ongoing contaminant migration away from the Site. The data also will be used to further define groundwater flow directions in the Gaspur Aquifer on and downgradient from the Site. The rationale for the new well locations and the selection of existing wells to be sampled were presented in the *Proposed Monitoring Well Locations, Southern Avenue Industrial Area Superfund Site, Remedial Investigation/Feasibility Study, Technical Memorandum* (ITSI Gilbane, 2013). The proposed new well locations along with groundwater analytical data from cone penetrometer testing (CPT)/HydroPunchtm (HP) borings that were used to support the well locations and design are included in Attachment 1 (see Figure A-1). This figure is discussed later in this technical memorandum.

Geologic and Hydrogeologic Conditions

Detailed background conditions are provided in the above-cited sampling and analysis plan (SAP, [ITSI Gilbane, 2012]). For convenience in understanding this technical memorandum, the geologic and hydrogeologic conditions at the Site are briefly described below.

- The Bellflower Aquiclude extends from the ground surface to a depth of approximately 60 feet below ground surface (bgs) and is composed primarily of fine-grained sediments (silts and clays).
- A laterally continuous layer of silty sand exists within the Bellflower Aquiclude between approximately 32 and 40 feet bgs and contains perched groundwater. (Deeper perched groundwater also has been noted at other sites in the vicinity of the Site.)

- The Gaspur Aquifer underlies the Bellflower Aquiclude and is composed of alluvial sands, gravels, silts, and some clays. The bottom of the Gaspur Aquifer is approximately 110 to 120 feet bgs in the vicinity of the Site. The potentiometric surface for the Gaspur Aquifer occurs at approximately 50 feet bgs, with a south to slightly southeast flow direction/gradient (groundwater elevation contour maps [Haley & Aldrich, 2014] are included in Attachment 1 to this technical memorandum).
- For the reporting of groundwater monitoring data from groundwater sampling programs for the Site and the adjacent Cooper Drum Superfund Site, the Gaspur Aquifer has been divided into three depth intervals, referred to as the Shallow Gaspur, Intermediate Gaspur, and Lower Gaspur Aquifer. However, water elevations in wells screened separately within the shallow, intermediate, and lower zones of the Gaspur Aquifer at these two sites generally are the same, indicating hydraulic connectivity between all three intervals.
- The Exposition Aquifer underlies the Gaspur Aquifer at a depth of approximately 120 feet bgs and generally is separated from the Gaspur Aquifer by a layer of low-permeability silts and clays. A downward vertical gradient has been observed between these two aquifers. Regional flow direction in the Exposition Aquifer tends to be southerly; however, water level data from the five existing wells completed in the upper Exposition Aquifer in the vicinity of the site do not show a consistent flow direction.

Background

Groundwater contamination has been reported in the Gaspur Aquifer from operations associated with the Site, the Cooper Drum Superfund Site, and the Jervis Webb Superfund Site. Initial investigations conducted on and downgradient from the Site have identified the presence of volatile organic compounds (VOCs) in groundwater. A brief summary of previous investigations conducted at the Site is presented in Attachment 2.

It should be noted that three potentially commingling groundwater plumes have been identified in the area. These plumes are the Cooper Drum plume, located west and cross-gradient of the Site; the Jervis Webb plume, north and upgradient of the Site; and an unnamed plume originating in the vicinity of MW-56 (see Figure 1), located southwest and cross-gradient of the Site near the intersection of Atlantic and Duncan Avenues. The plume in the vicinity of MW-56 has been classified as a release of TCE, cis-1,2 DCE, and trans-1,2-DCE to the Shallow Gaspur Aquifer with no identified source (Weston, 2012). Groundwater contamination also is being investigated under an RI/FS on the Los Angeles Unified School District (LAUSD) property, which is approximately 1,600 feet south and downgradient from the Site. Groundwater sampling results from monitoring wells installed on the LAUSD property (Parsons, 2008, and AECOM, 2013) are included in this technical memorandum. Finally, groundwater sampling results from the responsible parties that are implementing the remedial action at the Cooper Drum Company Superfund Site also are included in this technical memorandum (Haley & Aldrich, 2014).

Groundwater Sampling Activities

Field activities for groundwater sampling were conducted in March and August 2014. Samples were collected from a total of 32 wells (Figure 1) in the March 2014 sampling event and only from the 20 newly installed wells in August 2014. Samples were collected from six triple-completion wells representing the shallow (55-70 feet bgs), intermediate (70-90 feet bgs), and lower (90-114 feet bgs) zones of the Gaspur Aquifer. Samples also were collected from two single-completion wells completed in the Exposition Aquifer, at depths of approximately 130 feet bgs. The wells sampled are as follows:

- New Wells (March and August 2014) – SAIA-MW1A/B/C, SAIA-MW2A/B/C, SAIA-MW3A/B/C, SAIA-MW4A/B/C, SAIA-MW5A/B/C, SAIA-MW6A/B/C, SAIA-MW7, SAIA-MW8
- Existing Wells (March 2014 only) – MW-34, MW-35, MW-42, MW-43, MW-44, MW-45, MW-46, MW-47, MW-48, MW-49, MW-52, MW-56

Groundwater sampling was performed using low flow sampling methods. Samples were collected using a non-dedicated submersible pump equipped with electrical multi-flow controls to adjust the pump discharge rate to approximately 200 to 500 milliliters (mL) per minute, minimizing drawdown (<0.33 feet). Dedicated tubing was used for each well and each interval. The pump was decontaminated before sampling at each well location and/or interval in accordance with EPA-approved procedures.

Groundwater field parameters (pH, specific conductance, dissolved oxygen, temperature, oxidation-reduction potential, ferrous iron, and turbidity) were measured throughout the purging process. Purging was considered complete when at least three successive readings of parameters (recorded approximately every 3 to 5 minutes) were within the following criteria: ± 0.1 for pH, ± 3 percent for conductivity, ± 10 percent for dissolved oxygen, ± 10 millivolts (mv) for oxygen-reduction potential (ORP), less than 10 nephelometric turbidity units (NTUs) for turbidity (or 25 NTUs for clay formations, as necessary), and less than 0.33 feet (approximately four inches) of water level drawdown. In the event that turbidity was greater than 10 NTUs, the Puls and Barcelona (EPA, 1996) goal of ± 10 percent variance for NTUs was followed. Groundwater samples were submitted for analysis of VOCs, semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), metals, 1,4-dioxane, and perchlorate. Samples also were analyzed for general chemistry parameters including alkalinity, chloride and sulfate, sodium, potassium, calcium, magnesium, iron, manganese, copper, and zinc. All samples were submitted in accordance with the required sample collection, preservation, and chain-of-custody procedures. Further details regarding sample collection, analytical, and quality control requirements are discussed in the SAP (ITSI Gilbane, 2012).

Groundwater Sampling Results

Table 1, “Monitoring Well Sampling VOCs Analytical Results March/August 2014,” presents results for VOC and 1,4-dioxane analysis. Concentrations of VOCs detected above the respective laboratory reporting limits were evaluated for potential risk to human health based on the MCLs (SWRCB, 2014). As shown in Table 1, the August 2014 sampling results are very similar to the March 2014 results and generally confirm those results. Figures 2 through 4 present TCE and cis-1,2-DCE results for the shallow, intermediate, and lower zones of the

Gaspur Aquifer, respectively. Figure 5 presents sampling results for TCE and cis-1,2-DCE for the five existing and two new wells installed in the upper portion of the Exposition Aquifer. As detailed later in this technical memorandum, the downgradient extent of contaminant migration in the Gaspur Aquifer is undefined by the results from the new wells; therefore, proposed CPT/HP locations downgradient from the new well locations are shown on Figures 1 through 5.

TCE, cis-1,2-DCE, and 1,4-dioxane were the most prevalent VOCs, and were detected at concentrations exceeding MCLs for one or more compounds in nearly all of the samples collected. Trans-1,2-DCE, 1,1-DCA, 1,2-DCA, and benzene also were detected at concentrations exceeding MCLs, although less frequently.

Table 2, “Monitoring Well Sampling SVOCs Analytical Results – March 2014,” presents results for SVOC analysis. SVOCs were not detected above the respective laboratory limits, with the exception of samples from MW-43 (bis[2-ethylhexyl] phthalate and diethyl phthalate), MW-52 (bis[2-ethylhexyl] phthalate), and SAIA-MW1C (carbazole). Detected concentrations did not exceed their respective MCLs.

Table 3, “Monitoring Well Sampling Non-VOCs Analytical Results – March 2014,” presents results for metals, perchlorate, and PCBs analyses. Arsenic, iron, and manganese were detected at concentrations exceeding MCLs in samples from nearly all locations. The presence of arsenic, iron, and manganese in nearly all wells, coupled with similar widespread distribution in soil, suggests that these metals may be naturally occurring in the Gaspur Aquifer. Additionally, concentrations of arsenic and manganese were consistent with groundwater data collected from nearby sites (URS, 2002). It should be noted that arsenic was not detected above the MCL in samples collected from wells completed in the deeper Exposition Aquifer.

Chromium, lead, and nickel were detected at concentrations exceeding MCLs or action levels (ALs). Perchlorate and PCBs were not detected in any samples above their respective laboratory reporting limits.

General chemistry parameters (e.g. alkalinity, chloride, sulfate, sodium, potassium, calcium, magnesium) were reported at elevated levels in nearly all of the samples.

Conclusions and Recommendations

TCE, cis-1,2-DCE, and 1,2-dioxane have been identified in groundwater beneath and in the vicinity of the Site at concentrations exceeding MCLs.

- Among the on-site wells, the highest concentrations of TCE and cis-1,2-DCE were detected in the Shallow Gaspur Aquifer in wells located in the southeastern portion of the Site (SAIA-MW1A, -MW2A, -HP10, -HP21, and -CPT04), with the highest concentrations detected at SAIA-MW01 (TCE at 7,400 ug/L and cis-1,2-DCE at 3,300 ug/L). VOCs at concentrations exceeding MCLs also were present in the Gaspur Aquifer upgradient (north) of the property (SAIA-HP17 and -HP18). However, concentrations at these locations typically were one to two orders of magnitude less than those at locations on the Site. The presence of VOCs in the Shallow, Intermediate, and Lower Gaspur Aquifer at the ELG Metals property suggests that, in addition to potential on-site VOC sources, a VOC plume may be migrating onto the Site from upgradient sources, such as the Jervis Webb Superfund Site.

- Among off-site and downgradient wells, the highest concentrations of TCE and cis-1,2-DCE were detected in the Intermediate Gaspar Aquifer, with the highest concentrations detected in the vicinity of SAIA-MW3B (TCE at 6,700 ug/L and cis-1,2-DCE at 7,000 ug/L) and -CPT06 (TCE at 270 ug/L and cis-1,2-DCE at 3,900 ug/L). VOCs exceeding MCLs also were detected in the Intermediate Gaspar Aquifer in wells farther downgradient from the Site (SAIA-MW4B, SAIA-CPT08, SAIA-MW5B, SAIA-CPT10, and SAIA-CPT11). VOC concentrations at these locations were consistent with those detected upgradient (TCE >100 ug/L and cis-1,2-DCE >1,000 ug/L). This suggests that VOCs emanating from the SAIA Site may be migrating off site to the south.
- Overall, impacts to the Exposition Aquifer at the Site are much less significant than those observed in the overlying Gaspar Aquifer. VOC contamination above MCLs appears to be isolated in the vicinity of SAIA-MW7 and -HP10. TCE and cis-1,2-DCE concentrations at these locations are one to two orders of magnitude less than those detected in the Gaspar Aquifer.
- Widespread distribution of arsenic and other metals at concentrations above MCLs suggests that their presence in groundwater is naturally occurring. This is supported by comparable data for metals in off-site groundwater, and a similar widespread distribution of metals in soil (ITSI Gilbane, 2014).
- The lateral extent of the VOC plume emanating from on-site and upgradient sources remains unclear. It is expected that the investigation scheduled for the Jervis Webb Superfund Site will address the potential upgradient sources that appear to be migrating beneath the ELG property and possibly the SAIA property. To further assess the extent of groundwater contamination downgradient of the Site, the following CPT/HP locations are proposed (see Figures 1 through 6):
 - Five CPT/HP borings, just south of Tweedy Boulevard on LAUSD property, bounded by Burtis Street to the east and approximately 200 feet west of Adella Avenue, are necessary to better define the extent of groundwater contamination in the Gaspar Aquifer migrating downgradient from the Site.
 - Two CPT/HP borings located approximately 400 feet south of Tweedy Boulevard, approximately 50 feet west of Adella Avenue and approximately 250 feet east of Adella Avenue, to further define the potential southern extent of groundwater contamination migrating downgradient from the Site in the Gaspar Aquifer. Results from CPT boring logs at these locations will further define the aquifer conditions beneath the LAUSD property. Generally, the wells on the LAUSD property are completed in two perched groundwater zones and only the Shallow Gaspar Aquifer, therefore conditions in the deeper zones of the Gaspar Aquifer are undefined. Collection of up to six groundwater samples will be attempted from each of the proposed CPT/HP locations. Samples will be collected from the perched zone(s), the three zones of the Gaspar Aquifer, and the upper portion of the Exposition Aquifer.

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ATTACHMENTS

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Proposed Monitoring Well Locations Technical Memorandum (ITSI Gilbane, 2013)
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TABLES

Table 1

Monitoring Well Sampling VOC Analytical Results March/August 2014

Southern Avenue Industrial Area Superfund Site, South Gate, California

Location	Sample ID	Sample Date	Sample Type	Screen Interval (bgs)	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	1,1-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	1,1-Dichloroethane	1,2-Dichloroethane	Benzene	1,2-Dichloropropane	1,4-Dioxane (p-Dioxane)	1,2,3-Trichloropropane	Toluene
MW34	MW34-0314	03/26/2014	N	58-68	<2.5	45	470	<2.5	25	<2.5	1.6 J	<2.5	<2.5	<2.5	1.3	<2.5	<2.5
MW34	MW934-0314	03/26/2014	FD	58-68	<2	38	450	<2	20	<2	1.3 J	<2	<2	<2	1.5	<2	<2
MW35	MW35-0314	03/26/2014	N	95-105	<0.5	6.9	58	<0.5	5.5	<0.5	0.33 J	5.8	<0.5	<0.5	2.3	<0.5	<0.5
MW42	MW42-0314	03/26/2014	N	56-66	<10	390	4,000	<10	75	<10	25	<10	<10	<10	24	<10	<10
MW43	MW43-0314	03/26/2014	N	77-87	<0.5	8.6	25	<0.5	1.4	<0.5	0.22 J	7.6	<0.5	<0.5	2.8	<0.5	<0.5
MW44	MW44-0314	03/26/2014	N	96-106	<0.5	2.9	21	<0.5	1.5	<0.5	0.2 J	4	<0.5	<0.5	2.8	<0.5	<0.5
MW45	MW45-0314	03/25/2014	N	79-89	<0.5	2.2	39	<0.5	3.7	<0.5	0.21	0.84	<0.5	<0.5	2.1	<0.5	<0.5
MW46	MW46-0314	03/24/2014	N	57-67	<0.5	8.6 J	47 J	<0.5	3.7 J	<0.5	0.097 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW47	MW47-0314	03/24/2014	N	77-87	<4	14	700	<4	47	<4	1.3 J	<4	<4	<4	1.8	<4	<4
MW48	MW48-0314	03/24/2014	N	98-108	<0.5	29	82	2.1	5.5	<0.5	1.6	6.9	<0.5	0.12	8.7	<0.5	<0.5
MW49	MW49-0314	03/26/2014	N	60-70	<0.5	2.9	41	<0.5	3.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW52	MW52-0314	03/25/2014	N	66-76	<0.5	6.1	18	<0.5	5	<0.5	<0.5	<0.5	<0.5	2.4	<0.5	<0.5	<0.5
MW52	MW952-0314	03/25/2014	FD	66-76	<0.5	5.6	16	<0.5	4.2	<0.5	<0.5	<0.5	<0.5	2.1	<0.5	<0.5	<0.5
MW56	MW56-0314	03/26/2014	N	62-72	<2	290	450	<2	15	<2	<2	<2	<2	<2	<0.5	<2	<2
SAIA-MW1A	SAIA-MW1A-0314	03/27/2014	N	60-65	<100	7,400 J	3,300	<100	71 J	<100	21 J	<100	<100	<100	1.6 J	<100	<100
	SAIA-MW1A-0814	08/25/2014	N	60-65	0.42 J	4,800	6,900	16	96 J	<360	17	<0.5	0.29 J	<0.5	1.4	<0.5	0.51
SAIA-MW1B	SAIA-MW1B-0314	03/27/2014	N	75-85	<0.5	17	59	<0.5	4.6	<0.5	0.25	0.48 J	<0.5	<0.5	1.9	<0.5	<0.5
	SAIA-MW1B-0814	08/25/2014	N	75-85	<0.5	4.3	51	<0.5	4.6	<0.5	0.19 J	0.52	<0.5	0.097 J	2.6	<0.5	<0.5
SAIA-MW1C	SAIA-MW1C-0314	03/27/2014	N	94-104	<4	420 J	370	<4	34	<4	3.9 J	35	<4	<4	18	<4	<4
	SAIA-MW1C-0814	08/25/2014	N	94-104	<0.5	210	560	6.5	47	1.4	4.2	52	3.7	0.1 J	22	<0.5	<0.5
SAIA-MW2A	SAIA-MW2A-0314	03/27/2014	N	60-65	<10	1,100 J	2,000	<10	74	<10	4.8 J	<10	<10	<10	12	<10	<10
	SAIA-MW2A-0814	08/25/2014	N	60-65	<0.5	1,300	2,500	7.7	110 J	5.5	7.2	0.25 J	0.35 J	<0.5	16	<0.5	<0.5
	SAIA-MW92A-0814	08/25/2014	FD	60-65	<0.5	1,300	2,400	7.7	120 J	5.3	7	<0.5	0.35 J	<0.5	15	<0.5	<0.5
SAIA-MW2B	SAIA-MW2B-0314	03/27/2014	N	76-86	<0.5	6.8 J	69	<0.5	7.2	<0.5	<0.5	6.6	<0.5	<0.5	1.7	<0.5	<0.5
	SAIA-MW2B-0814	08/25/2014	N	76-86	<0.5	2.8	51	0.5	5.9	0.75	0.11 J	5.1	0.2 J	0.23 J	1.3	<0.5	<0.5
SAIA-MW2C	SAIA-MW2C-0314	03/27/2014	N	96-106	<2	260 J	360	4.7	28	<2	3	32	6.1	0.19	14	<2	<2
	SAIA-MW2C-0814	08/25/2014	N	96-106	<0.5	200	370	5.2	33	3.3	2.8	34	4.7	<0.5	20	<0.5	<0.5
SAIA-MW3A	SAIA-MW3A-0314	03/24/2014	N	58-68	<0.5	9.2	8.9	<0.5	0.2	<0.5	0.13	<0.5	<0.5	<0.5	<0.5	<0.5	0.073
	SAIA-MW3A-0814	08/26/2014	N	58-68	<0.5	3.6	5.8	<0.5	0.15 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.46	<0.5	1.3
SAIA-MW3B	SAIA-MW3B-0314	03/24/2014	N	76-86	<25	6,700 J	7,000	18 J	120	<25	49	<25	<25	<25	110	<25	<25
	SAIA-MW3B-0814	08/26/2014	N	76-86	<0.5	6,600	9,100	20	230 J	47	72	2.1	1.5	<0.5	86	<0.5	1.1
SAIA-MW3C	SAIA-MW3C-0314	03/24/2014	N	96-106	<0.5	2.1	38	<0.5	2.5	<0.5	0.2	1.8	<0.5	0.23	1.5	<0.5	<0.5
	SAIA-MW93C-0314	03/24/2014	FD	96-106	<0.5	2	37	<0.5	2.5	<0.5	0.2	1.6	<0.5	0.25	1.6	<0.5	<0.5
	SAIA-MW3C-0814	08/26/2014	N	96-106	<0.5	6	27	<0.5	2.6	6.1	0.25 J	2.1	0.085 J	0.27 J	<0.46	<0.5	<0.5
SAIA-MW4A	SAIA-MW4A-0314	03/25/2014	N	58-68	<0.5	0.53	4.7	<0.5	0.19	<0.5	0.32	<0.5	<0.5	<0.5	1.6	<0.5	<0.5
	SAIA-MW4A-0814	08/26/2014	N	58-68	<0.5	0.19 J	0.72	<0.5	<0.5	<0.5	0.34 J	<0.5	<0.5	<0.5	1.8	<0.5	<0.5

Table 1

Monitoring Well Sampling VOC Analytical Results March/August 2014

Southern Avenue Industrial Area Superfund Site, South Gate, California

Location	Sample ID	Sample Date	Sample Type	Screen Interval (bgs)	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	1,1-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	1,1-Dichloroethane	1,2-Dichloroethane	Benzene	1,2-Dichloropropane	1,4-Dioxane (p-Dioxane)	1,2,3-Trichloropropane	Toluene
SAIA-MW4B	SAIA-MW4B-0314	03/25/2014	N	74-84	<25	790	4,200	<25	130	<25	15 J	<25	<25	<25	58	<25	<25
	SAIA-MW4B-0814	08/26/2014	N	74-84	<0.5	150 J	4,800	6.6	180 J	6.5	18	0.72	0.55	<0.5	60	<0.5	<0.5
	SAIA-MW94B-0814	08/26/2014	FD	74-84	<0.5	150 J	4,800	6.6	180 J	6.5	18	0.69	0.55	<0.5	59	<0.5	<0.5
SAIA-MW4C	SAIA-MW4C-0314	03/25/2014	N	92-102	<10	3.9 J	910	<10	53	<10	3.6 J	<10	<10	<10	14	<10	<10
	SAIA-MW4C-0814	08/26/2014	N	92-102	<0.5	3.4	910	1.3	73	11	4.1	2.1	0.19 J	0.3 J	11	<0.5	1.1
SAIA-MW5A	SAIA-MW5A-0314	03/25/2014	N	58-68	<5	1.8 J	530	<5	21	<5	<5	<5	<5	<5	2.4	<5	1.4 J
	SAIA-MW5A-0814	08/27/2014	N	58-68	<0.5	1.9	520	0.89	24 J	0.72	0.42 J	<0.5	<0.5	<0.5	2.3	<0.5	0.77
SAIA-MW5B	SAIA-MW5B-0314	03/25/2014	N	76-86	<25	380	3,100	<25	98	<25	<25	<25	<25	<25	16	<25	8.9 J
	SAIA-MW5B-0814	08/27/2014	N	76-86	<0.5	99 J	3,600	5.5	120 J	4.5	9.5	0.52	0.36 J	<0.5	23	<0.5	1.2
SAIA-MW5C	SAIA-MW5C-0314	03/25/2014	N	96-106	<4	6.5	300	<4	21	<4	<4	2 J	<4	<4	3.4	<4	<4
	SAIA-MW5C-0814	08/27/2014	N	96-106	<0.5	4.8	320	0.8	25	<0.5	0.64	1.9	0.18 J	0.26 J	3.2	<0.5	<0.5
SAIA-MW6A	SAIA-MW6A-0314	03/24/2014	N	58-68	<0.5	0.087	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.52	<0.5	<0.5
	SAIA-MW6A-0814	08/27/2014	N	58-68	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.53	<0.5	0.68
SAIA-MW6B	SAIA-MW6B-0314	03/24/2014	N	76-81	<0.5	3.7	13	<0.5	3.9	<0.5	<0.5	0.12	<0.5	<0.5	<0.5	<0.5	0.069
	SAIA-MW6B-0814	08/27/2014	N	76-81	<0.5	3.6	14	<0.5	5.1	<0.5	<0.5	<0.5	<0.5	<0.5	0.26 J	<0.5	0.99
SAIA-MW6C	SAIA-MW6C-0314	03/24/2014	N	90-100	<0.5	2	17	<0.5	2.3	<0.5	<0.5	0.2	<0.5	<0.5	0.52	<0.5	0.075
	SAIA-MW6C-0814	08/27/2014	N	90-100	<0.5	2.4	21	<0.5	2.8	<0.5	<0.5	<0.5	<0.5	<0.5	0.52	<0.5	<0.5
SAIA-MW7	SAIA-MW7-0314	03/27/2014	N	122-132	<0.5	24 J	16	<0.5	1.1	<0.5	0.3	0.96	<0.5	<0.5	1.9	<0.5	<0.5
	SAIA-MW97-0314	03/27/2014	FD	122-132	<0.5	22 J	17	<0.5	1.1	<0.5	0.37	1.1	<0.5	<0.5	2	<0.5	<0.5
	SAIA-MW7-0814	08/25/2014	N	122-132	<0.5	22	57	0.65	2.5	1.3	0.67	1.6	0.14 J	<0.5	3.6	<0.5	<0.5
SAIA-MW8	SAIA-MW8-0314	03/24/2014	N	124-134	<0.5	0.53	0.83	<0.5	0.08	<0.5	<0.5	0.18	<0.5	<0.5	<0.5	<0.5	0.18
	SAIA-MW8-0814	08/25/2014	N	124-134	<0.5	3.9	1.9	<0.5	0.2 J	<0.5	<0.5	0.62	<0.5	<0.5	0.16 J	<0.5	<0.5

Screening Criteria

MCL* (ug/L)					5	5	6	6	10	0.5	5	0.5	1	5	1 ³	0.005 ³	150
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exceeds California MCL

* Based on State Water Resources Control Board maximum contaminant levels (MCLs; July 2014).

J = estimated value

Notes:

N = normal sample

1) Results reported in micrograms per liter (ug/L).

2) Concentrations detected at or above laboratory reporting limits are shown in bold font.

3) Based on California Department of Public Health Notification Level.

Abbreviations:

<#.#= not detected at the indicated reporting limit

bgs = feet below ground surface

FD = field duplicate

Table 2
Monitoring Well Sampling SVOCs Analytical Results - March 2014
Southern Avenue Industrial Area Superfund Site, South Gate, California

* Based on State Water Resources Control Board maximum contaminant levels (M

Notes: [View](#) [Edit](#) [Delete](#) [Details](#)

2) Concentration

Abbreviations:

Abbreviations:

$\text{bsc} = \text{feet below ground}$

bgs = feet below ground

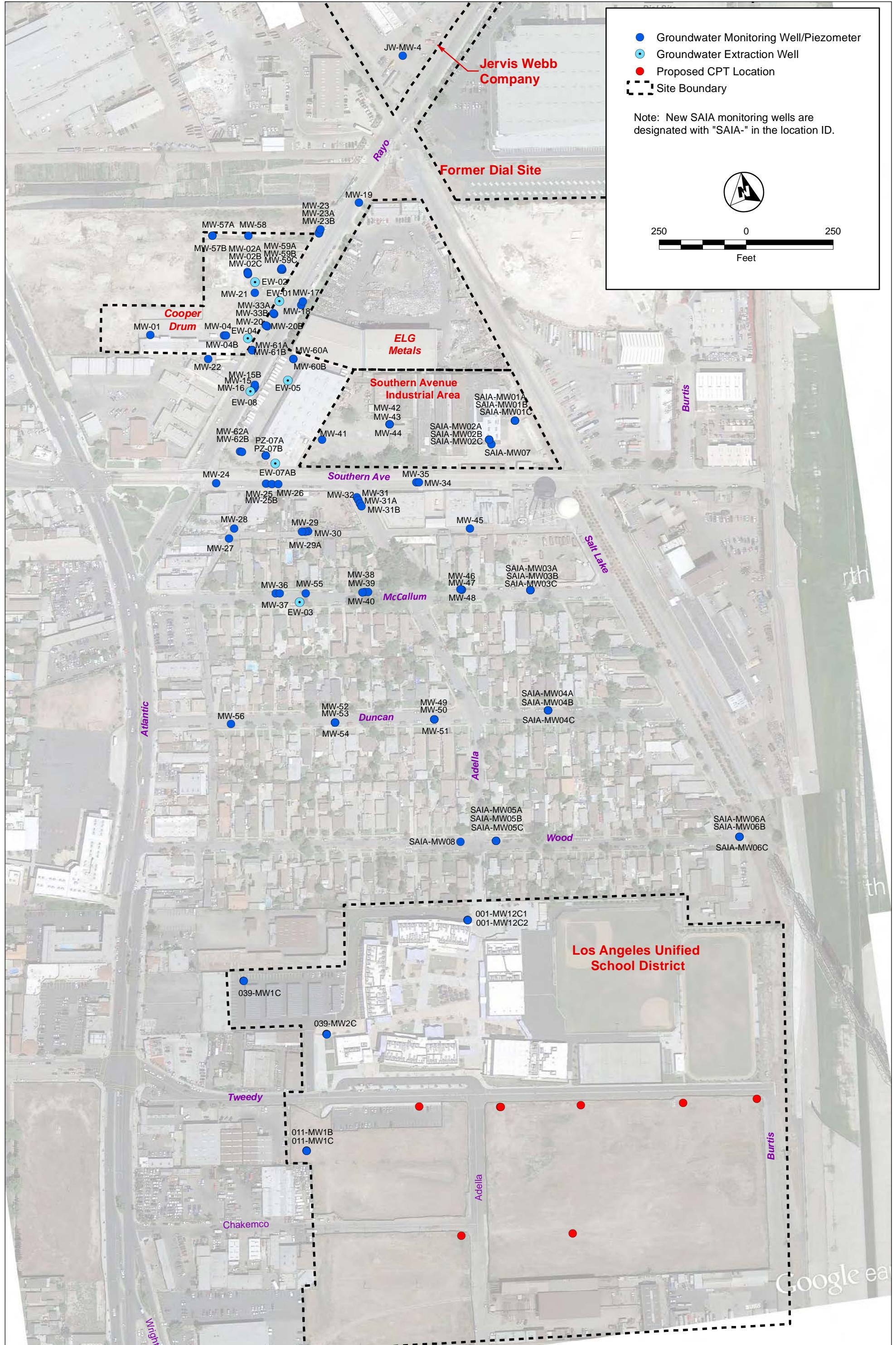
FD = Field duplicate
N = normal sample

Table 3

Monitoring Well Sampling Non-VOCs Analytical Results - March 2014
 Southern Avenue Industrial Area Superfund Site, South Gate, California

Location	Sample ID	Sample Date	Sample Type	Sample Depth (bgs)	Alkalinity, Bicarbonate (as CaCO ₃)	Alkalinity, Carbonate (as CaCO ₃)	Alkalinity, Hydroxide (as CaCO ₃)	Total Dissolved Solids	Cyanide	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Sodium	Silver	Thallium	Titanium	Vanadium	Zinc	Chloride	Sulfate (as SO ₄)	Percarbonate	Total Organic Carbon	PCB-1016 (Actor 1016)	PCB-1221 (Actor 1221)	PCB-1242 (Actor 1242)	PCB-1248 (Actor 1248)	PCB-1260 (Actor 1260)	PCB-1262 (Actor 1262)	PCB-1268 (Actor 1268)
MW34	MW34-0314	03/26/2014	N	58-68	930,000	<10000	<10000	930,000	1,600,000	<10	<20	<2	100	52.6	<1	126,000	7.5	11.3	<2	1,340 J	0.64 J	40,300	816	<0.2	4.3	<5000	5	374,000	0.06 J	<1	<5	5.4	40,000	400,000	<0.3	4,500	<1	<1	<1	<1	<1	<1	
MW34	MW934-0314	03/26/2014	FD	58-68	900,000	<10000	<10000	900,000	1,600,000	<10	<20	<2	102	54.6	<1	<1	126,000	5	11.5	2.7	1,250 J	0.62 J	40,500	844	<0.2	3.9	<5000	<5	373,000	0.073 J	<1	<5	6.2	40,000	400,000	<0.3	5,100	<1	<1	<1	<1	<1	<1
MW35	MW35-0314	03/26/2014	N	95-105	670,000	<10000	<10000	670,000	6,000,000	--	79.8	<2	22.5	28.9	<1	1.3	580,000	5.2	48.7	2.9	4,340 J	1.3	214,000	4,340	<0.2	5	7,670	<5	842,000	0.12 J	<1	<5	17.2	170,000	3,600,000	--	5,500	--	--	--	--	--	--
MW42	MW42-0314	03/26/2014	N	56-66	860,000	<10000	<10000	860,000	1,300,000	<10	31,300	<2	78.3	457	0.75 J	1.3	210,000	79.1	43.9	57.5	58,100 J	20.3	75,500	2,120	<0.2	73.4	11,700	<10	221,000	0.14 J	<1	53.5	157	46,000	190,000	<0.3	9,100	<1	<1	<1	<1	<1	<1
MW43	MW43-0314	03/26/2014	N	77-87	690,000	<10000	<10000	690,000	4,800,000	<10	1,150	<2	31.2	46.2	<2	0.38 J	457,000	24.7	40.1	5.6	4,780 J	1.3	167,000	3,830	<0.2	20	5,710	<10	673,000	0.096 J	<1	<10	10.9	140,000	2,800,000	<0.3	5,400	<1	<1	<1	<1	<1	<1
MW44	MW44-0314	03/26/2014	N	96-106	640,000	<10000	<10000	640,000	5,700,000	<10	136	<2	31.6	23.8	<2	<1	493,000	9.5	44.3	<4	4,860 J	0.37 J	204,000	4,330	<0.2	7.2	7,170	<10	909,000	0.1 J	<1	<10	11.1	150,000	3,400,000	<0.3	5,600	<1	<1	<1	<1	<1	<1
MW45	MW45-0314	03/25/2014	N	79-89	580,000	<10000	<10000	580,000	2,400,000	--	268 J	<2	21.6 J	41.2	<1	0.28 J	339,000	12.7	0.65 J	2.7	2,430 J	1.6	111,000	1,940	<0.2	10.9	3,700 J	<5	201,000	0.048 J	<1	<5	12.8 J	120,000	1,100,000	--	3,300	--	--	--	--	--	--
MW46	MW46-0314	03/24/2014	N	57-67	830,000	16,000	<10000	850,000	1,700,000	--	57.3 J	<2	50 J	42.3	<1	0.17 J	126,000	3.8	0.25 J	7.3	1,050 J	0.43 J	42,600	764	<0.2	3.1	6,800	<5	439,000	0.088 J	<1	<5	18.8 J	86,000	500,000	--	4,200	--	--	--	--	--	--
MW47	MW47-0314	03/24/2014	N	77-87	670,000	<10000	<10000	670,000	1,300,000	--	303 J	<2	34 J	50.1	<1	<1	143,000	5	0.52 J	2.4	1,210 J	1.2	43,000	1,040	<0.2	4.3	2,860 J	<5	199,000	0.057 J	<1	<5	11.5 J	49,000	340,000	--	5,800	--	--	--	--	--	--
MW48	MW48-0314	03/24/2014	N	98-108	670,000	<10000	<10000	670,000	2,800,000	--	<20	<2	24.2 J	44	<1	0.5 J	395,000	3.6	0.3 J	2.2	2,350 J	0.33 J	131,000	2,550	<0.2	4.4	4,440 J	<5	241,000	0.076 J	<1	<5	12.8 J	250,000	1,200,000	--	4,600	--	--	--	--	--	--
MW49	MW49-0314	03/26/2014	N	60-70	890,000	<10000	<10000	890,000	5,300,000	--	618	<2	66.5	37.6	<2	0.12 J	433,000	67.9	43.4	8.2	5,640 J	0.69 J	177,000	3,930	<0.2	145	9,470	<10	754,000	0.14 J	<1	<10	10.8	170,000	3,000,000	--	3,700	--	--	--	--	--	--
MW52	MW52-0314	03/25/2014	N	66-76	760,000	<10000	<10000	760,000	3,200,000	--	52.9 J	<2	26.8 J	46.8	<1	<1	395,000	5.1	0.68 J	2.4	3,710 J	0.8 J	142,000	3,520	<0.2	5	5,750	<5	340,000	0.061 J	<1	<5	11 J	170,000	1,500,000	--	4,900	--	--	--	--	--	--
MW52	MW52-0314	03/25/2014	FD	66-76	780,000	<10000	<10000	780,000	3,200,000	--	83.5 J	<2	23.3 J	45.8	<1	<1	395,000	7.6	0.72 J	2.6	3,740 J	0.41 J	142,000	3,370	<0.2	4.7	5,740	<5	340,000	0.076 J	<1	<5	9.1 J	180,000	1,500,000	--	4,900	--	--	--	--	--	--
MW56	MW56-0314	03/26/2014	N	62-72	610,000	<10000	<10000	610,000	1,300,000	--	407	<2	24.2	80.5	<2	<1	178,000	4.9	15.3	<4	1,870 J	0.73 J	43,000	1,350	<0.2	4.5	<5000	<10	190,000	<1	<1	<10	6.7	84,000	400,000	--	2,800	--	--	--	--	--	--
SAIA-MW1A	SAIA-MW1A-0314	03/27/2014	N	60-65	600,000	<10000	<10000	600,000	1,000,000	<10	1,330	<2	16.1	95.1	<2	<1	105,000	20.5	10.7	5.4	2,700 J	1.6	38,600	480	<0.2	12.7	7,630	<10	163,000	0.15 J	<1	<10	14.6	53,000	180,000	<0.3	23,000	R	R	R	R	R	R
SAIA-MW1B	SAIA-MW1B-0314	03/27/2014	N	75-85	610,000	<10000	<10000	610,000	3,300,000	<10	366	<2	23.8	67.4	<2	<1	421,000	7.1	37.7	<4	3,350 J	0.57 J	147,000	2,510	<0.2	7.8	<50																

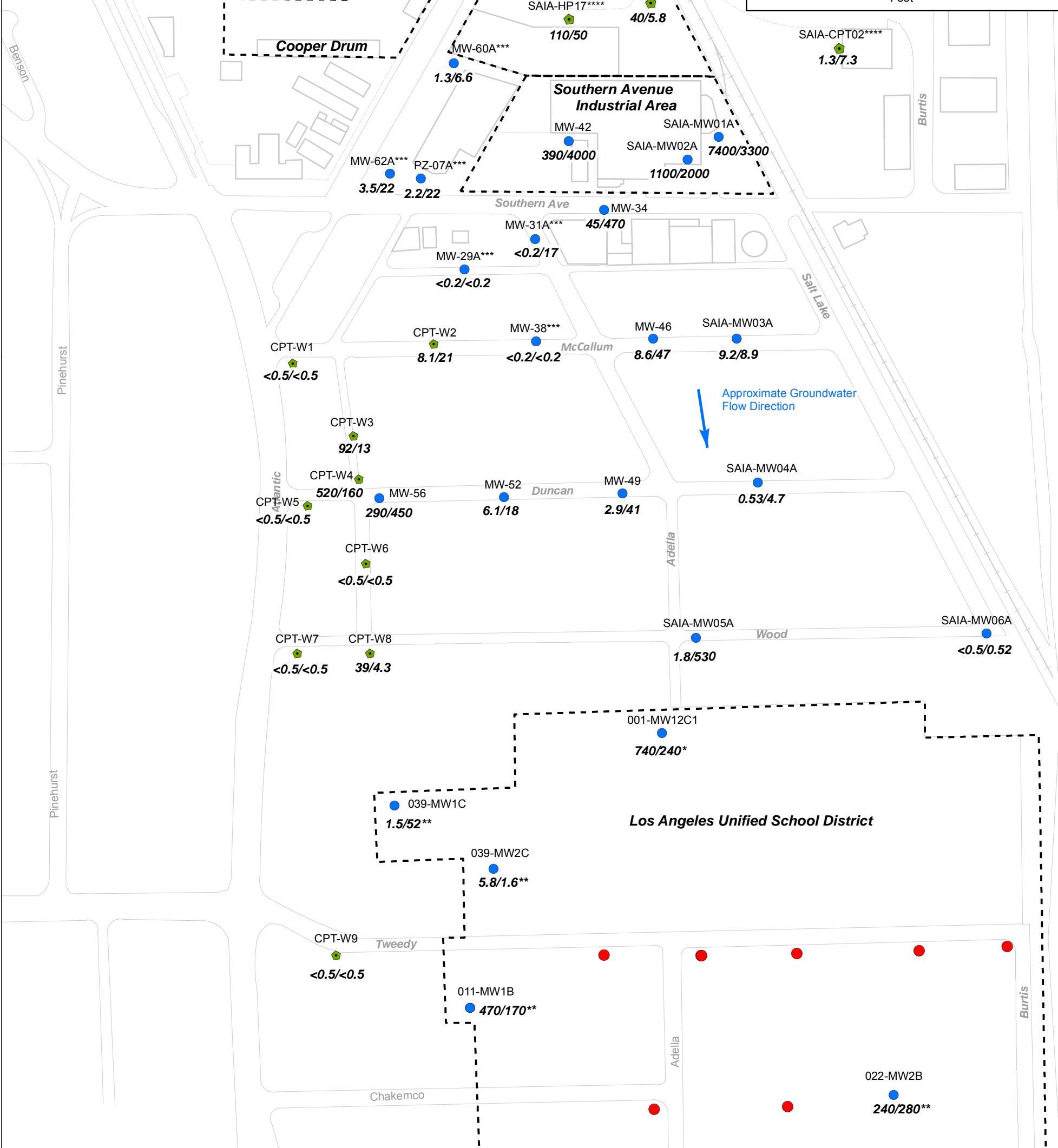
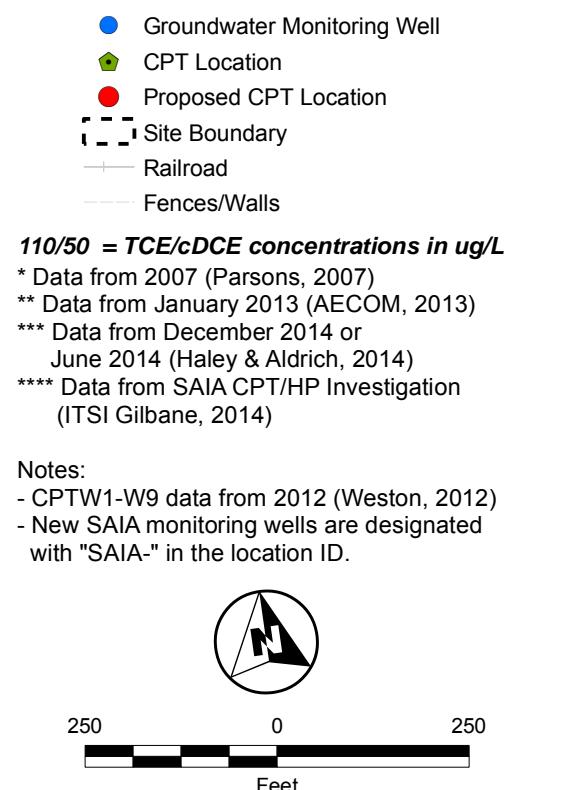
FIGURES



Location	Sample Date	Sample Type	Sampled Interval	TCE	cis-1,2-DCE	1,4-Dioxane
MW-34	03/26/2014	N	58-68	45	470	1.3
MW-34	03/26/2014	FD	58-68	38	450	1.5
MW-42	03/26/2014	N	56-66	390	4,000	24
MW-46	03/24/2014	N	57-67	8.6 J	47 J	<0.5
MW-49	03/26/2014	N	60-70	2.9	41	<0.5
MW-52	03/25/2014	N	66-76	6.1	18	<0.5
MW-52	3/25/2014	FD	66-76	5.6	16	<0.5
MW-56	03/26/2014	N	62-72	290	450	<0.5
SAIA-MW01A	03/27/2014	N	60-65	7,400 J	3,300	1.6 J
SAIA-MW02A	03/27/2014	N	60-65	1,100 J	2,000	12
SAIA-MW03A	03/24/2014	N	58-68	9.2	8.9	<0.5
SAIA-MW04A	03/25/2014	N	58-68	0.53	4.7	1.6
SAIA-MW05A	03/25/2014	N	58-68	1.8 J	530	2.4
SAIA-MW06A	03/24/2014	N	58-68	0.087	<0.5	0.52
*MCL (ug/L)				5	6	1

* Based on State Water Resources Control Board maximum contaminant levels (MCLs; July 2014).

Bold values exceed MCLs



Location	Sample Date	Sample Type	Sampled Interval	TCE	cis-1,2-DCE	1,4-Dioxane
MW43	03/26/2014	N	77-87	8.6	25	2.8
MW45	03/25/2014	N	79-89	2.2	39	2.1
MW47	03/24/2014	N	77-87	14	700	1.8
SAIA-MW1B	03/27/2014	N	75-85	17	59	1.9
SAIA-MW2B	03/27/2014	N	76-86	6.8 J	69	1.7
SAIA-MW3B	03/24/2014	N	76-86	6,700 J	7,000	110
SAIA-MW4B	03/25/2014	N	74-84	790	4,200	58
SAIA-MW5B	03/25/2014	N	76-86	380	3,100	16
SAIA-MW6B	03/24/2014	N	76-81	3.7	13	<0.5
*MCL (ug/L)				5	6	1 ³

* Based on State Water Resources Control Board maximum contaminant levels (MCLs; July 2014).

Bold values exceed MCLs

● Groundwater Monitoring Well

◆ CPT Location

● Proposed CPT Location

- - - Site Boundary

- - Railroad

- - - Fences/Walls

8.6/25 = TCE/cDCE concentrations in ug/L

* Data from 2007 (Parsons, 2007)

** Data from January 2013 (AECOM, 2013)

*** Data from December 2014 or

June 2014 (Haley & Aldrich, 2014)

**** Data from SAIA CPT/HP Investigation

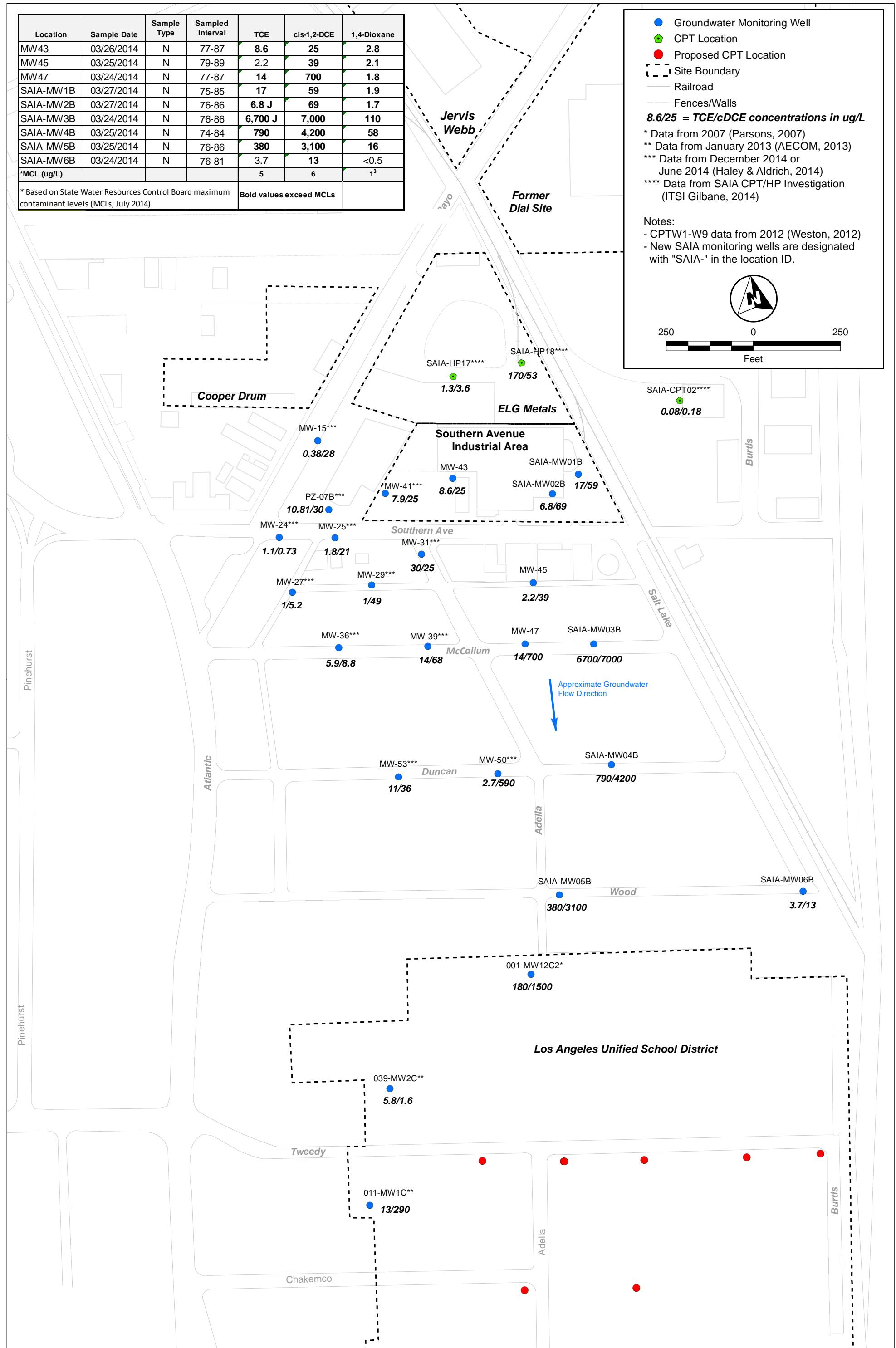
(ITSI Gilbane, 2014)

Notes:

- CPTW1-W9 data from 2012 (Weston, 2012)
- New SAIA monitoring wells are designated with "SAIA-" in the location ID.



250 0 250
Feet



LOCID	Sample Date	Sample Type	Sampled Interval	TCE	cis-1,2-DCE	Dioxane
MW-35	03/26/2014	N	95-105	6.9	58	2.3
MW-44	03/26/2014	N	96-106	2.9	21	2.8
MW-48	03/24/2014	N	98-108	29	82	8.7
SAIA-MW01C	03/27/2014	N	94-104	420 J	370	18
SAIA-MW02C	03/27/2014	N	96-106	260 J	360	14
SAIA-MW03C	03/24/2014	N	96-106	2.1	38	1.5
SAIA-MW03C	03/24/2014	FD	96-106	2	37	1.6
SAIA-MW04C	03/25/2014	N	92-102	3.9 J	910	14
SAIA-MW05C	03/25/2014	N	96-106	6.5	300	3.4
SAIA-MW06C	03/24/2014	N	90-100	2	17	0.52
MCL* (ug/L)				5	6	1 ³

* Based on State Water Resources Control Board maximum contaminant levels (MCLs; July 2014).

Bold values exceed MCLs

● Groundwater Monitoring Well

◆ CPT Location

● Proposed CPT Location

- - - Site Boundary

- - Railroad

- - - Fences/Walls

8.6/25 = TCE/cDCE concentrations in ug/L

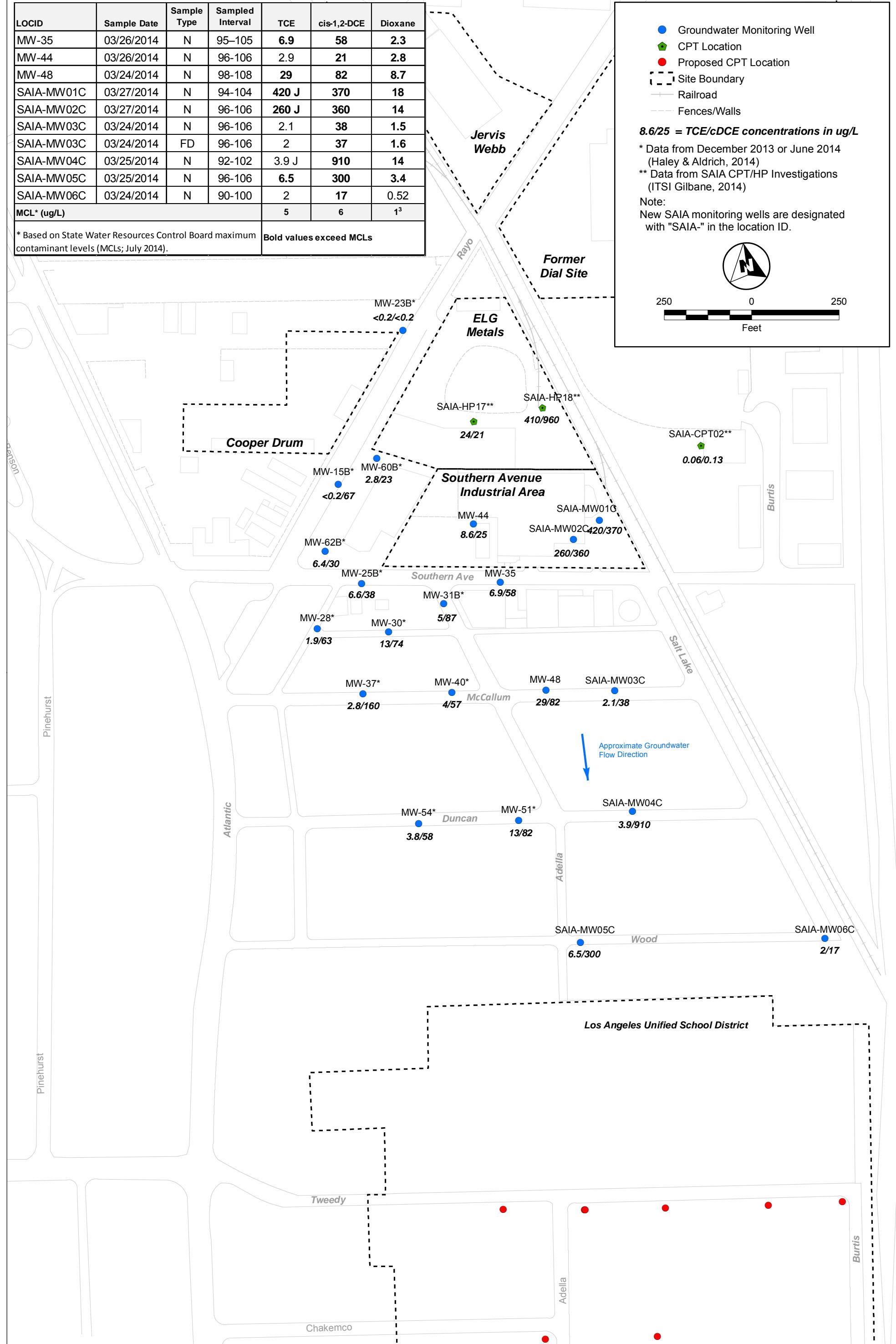
* Data from December 2013 or June 2014 (Haley & Aldrich, 2014)

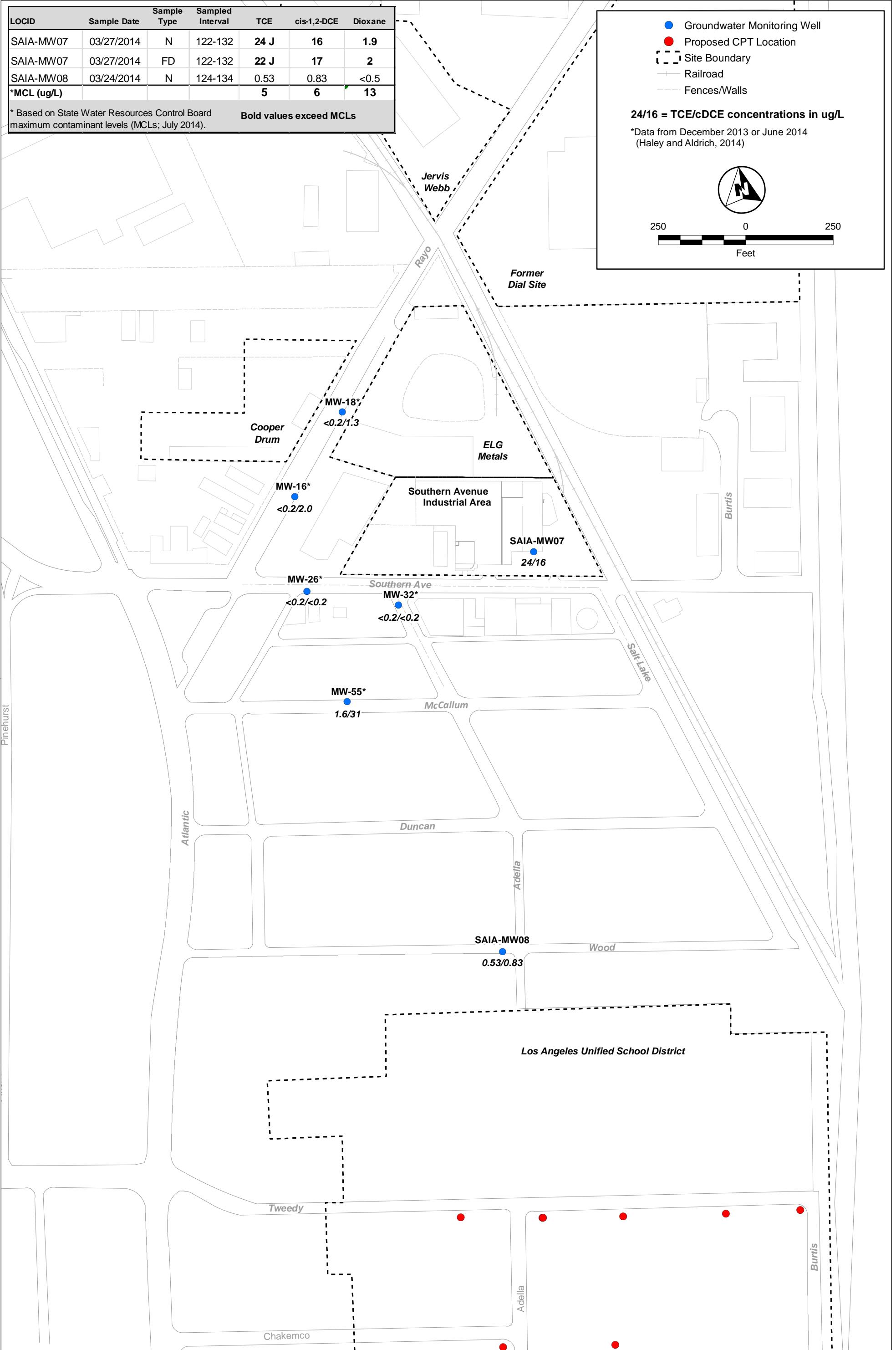
** Data from SAIA CPT/HP Investigations (ITSI Gilbane, 2014)

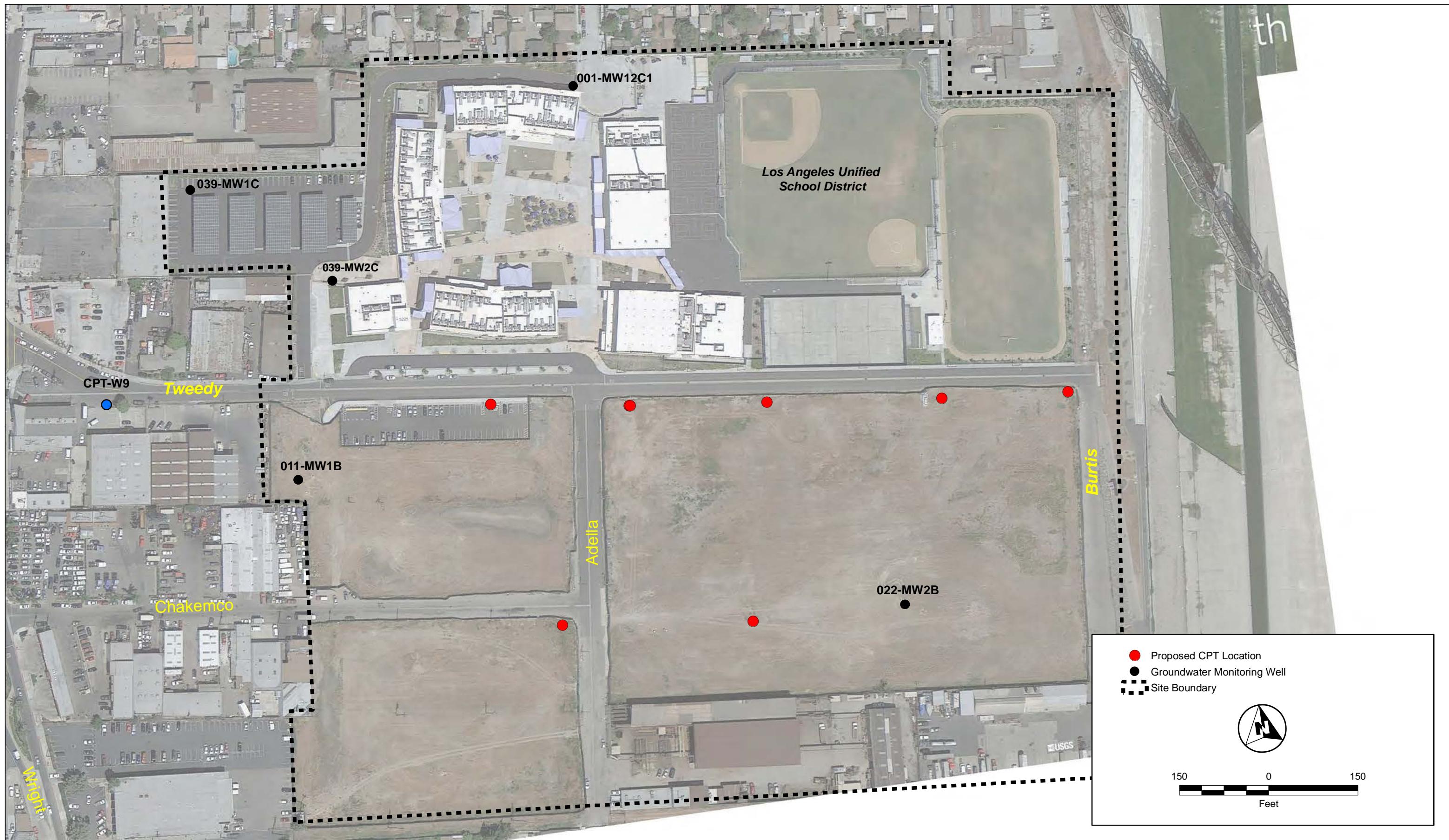
Note:
New SAIA monitoring wells are designated with "SAIA-" in the location ID.



250 0 250
Feet



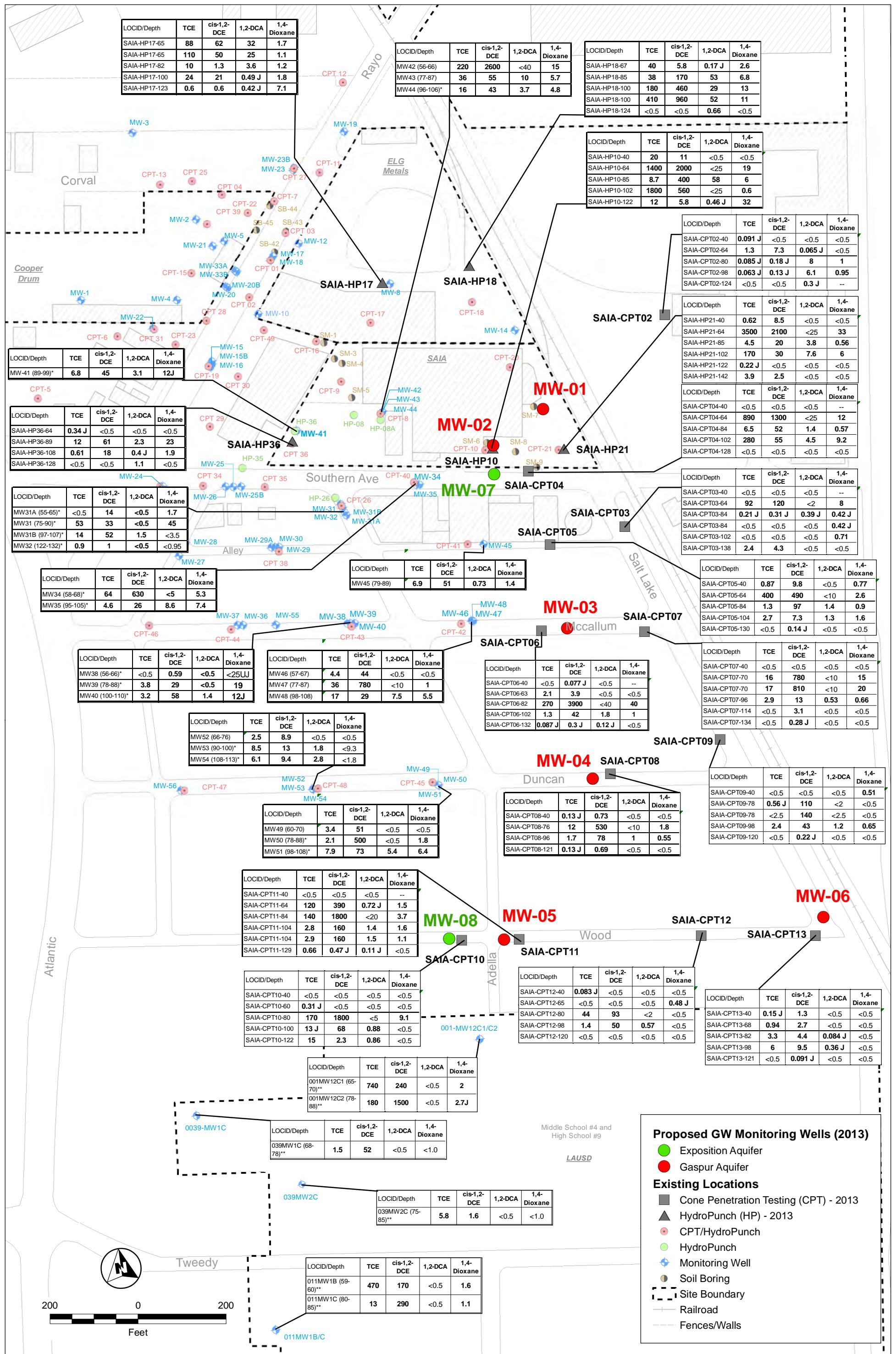


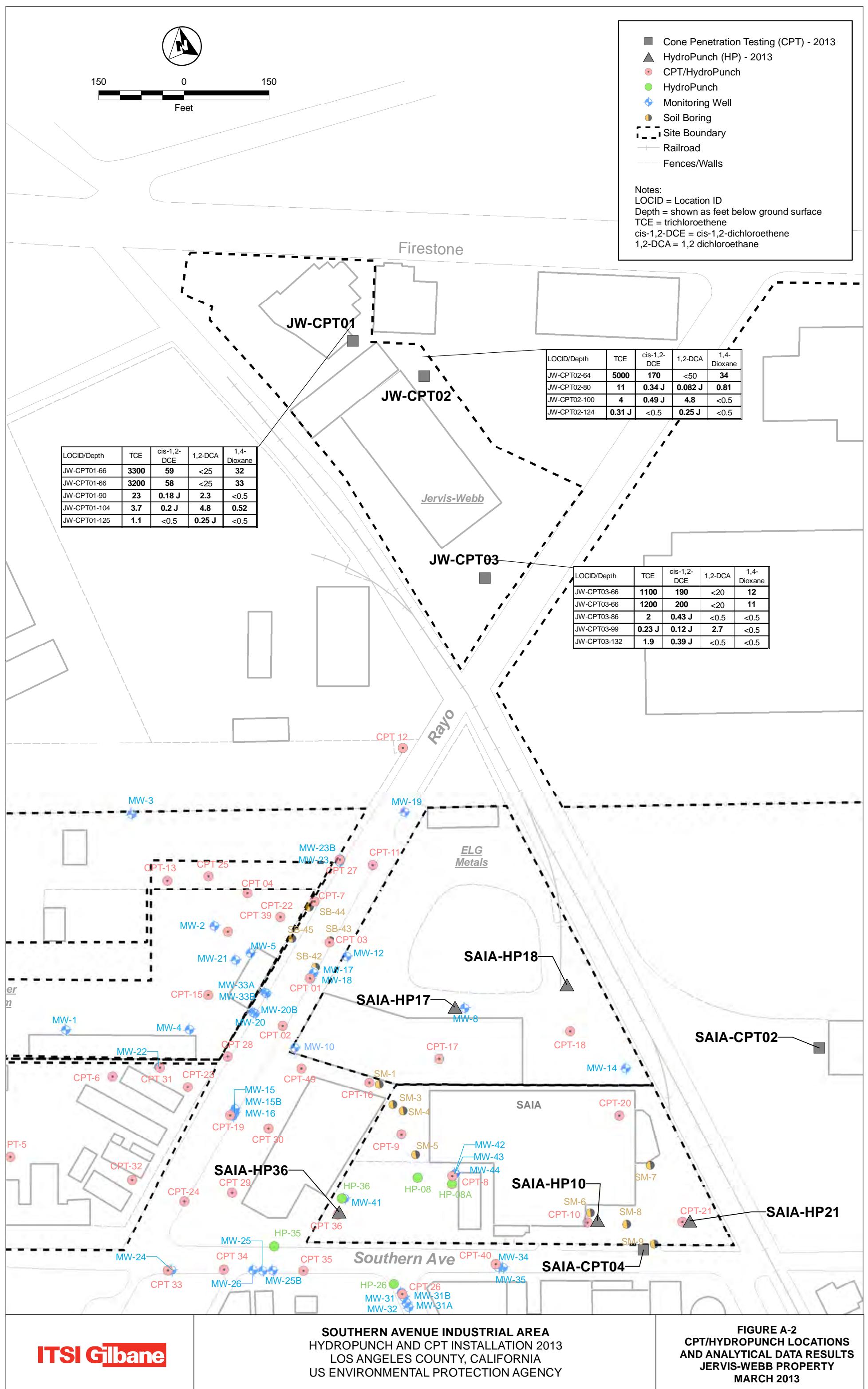


ATTACHMENT 1

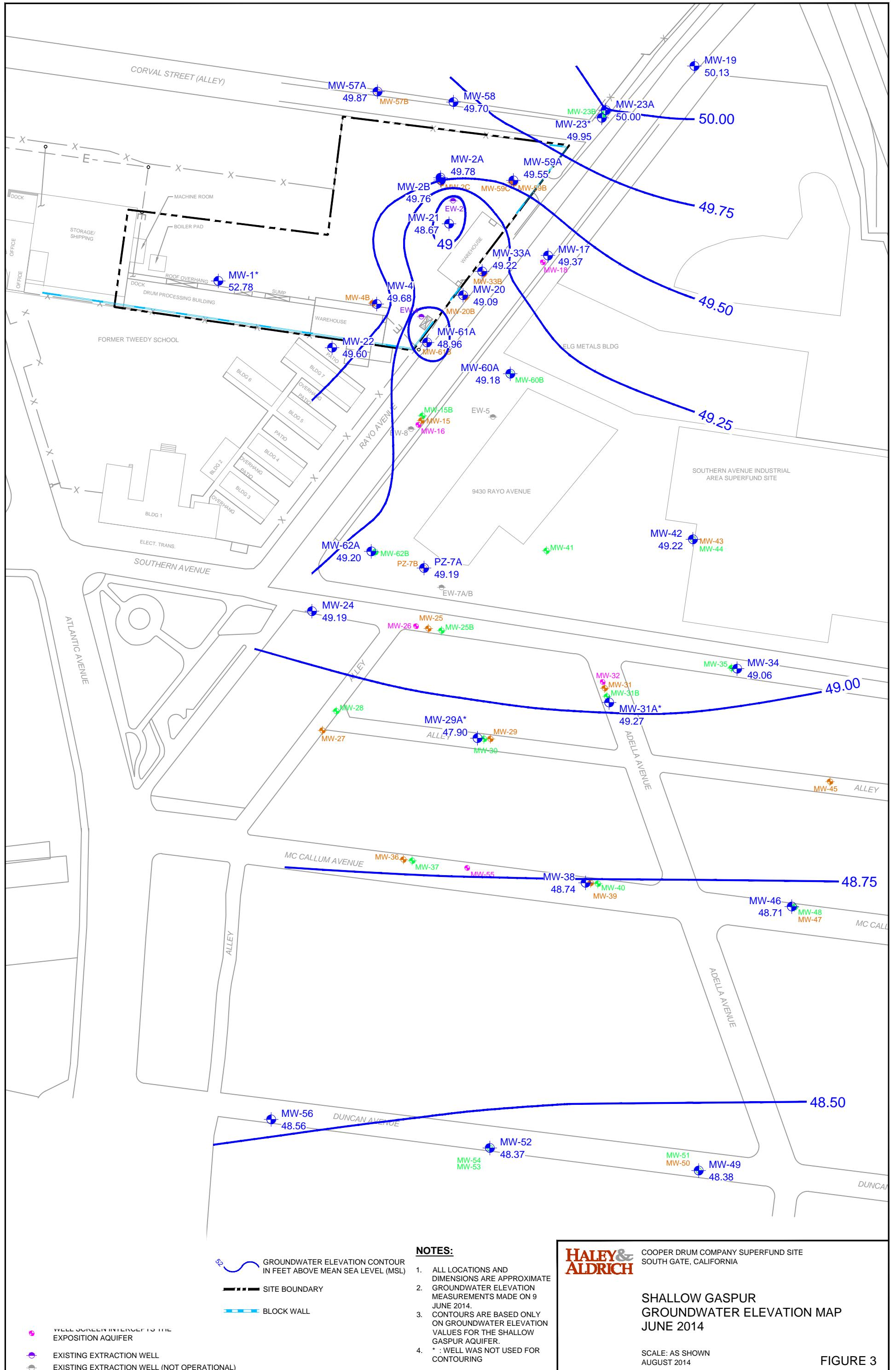
Referenced Figures

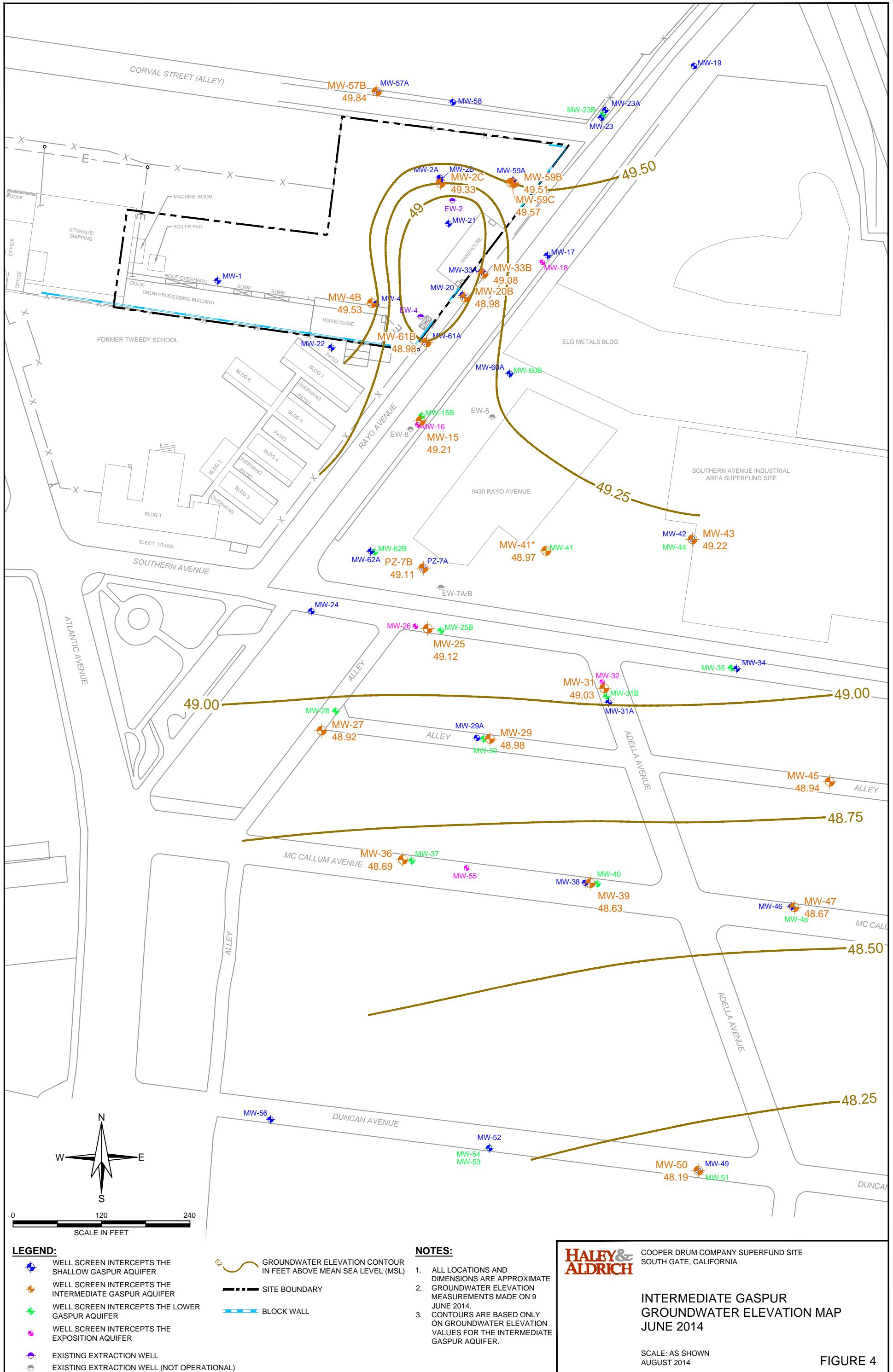
Proposed Groundwater Monitoring Well Locations (Figure A-1) and CPT/Hydropunch Locations and Analytical Results, Jervis Webb Property, (Figure A-2), (ITSI Gilbane, 2013)

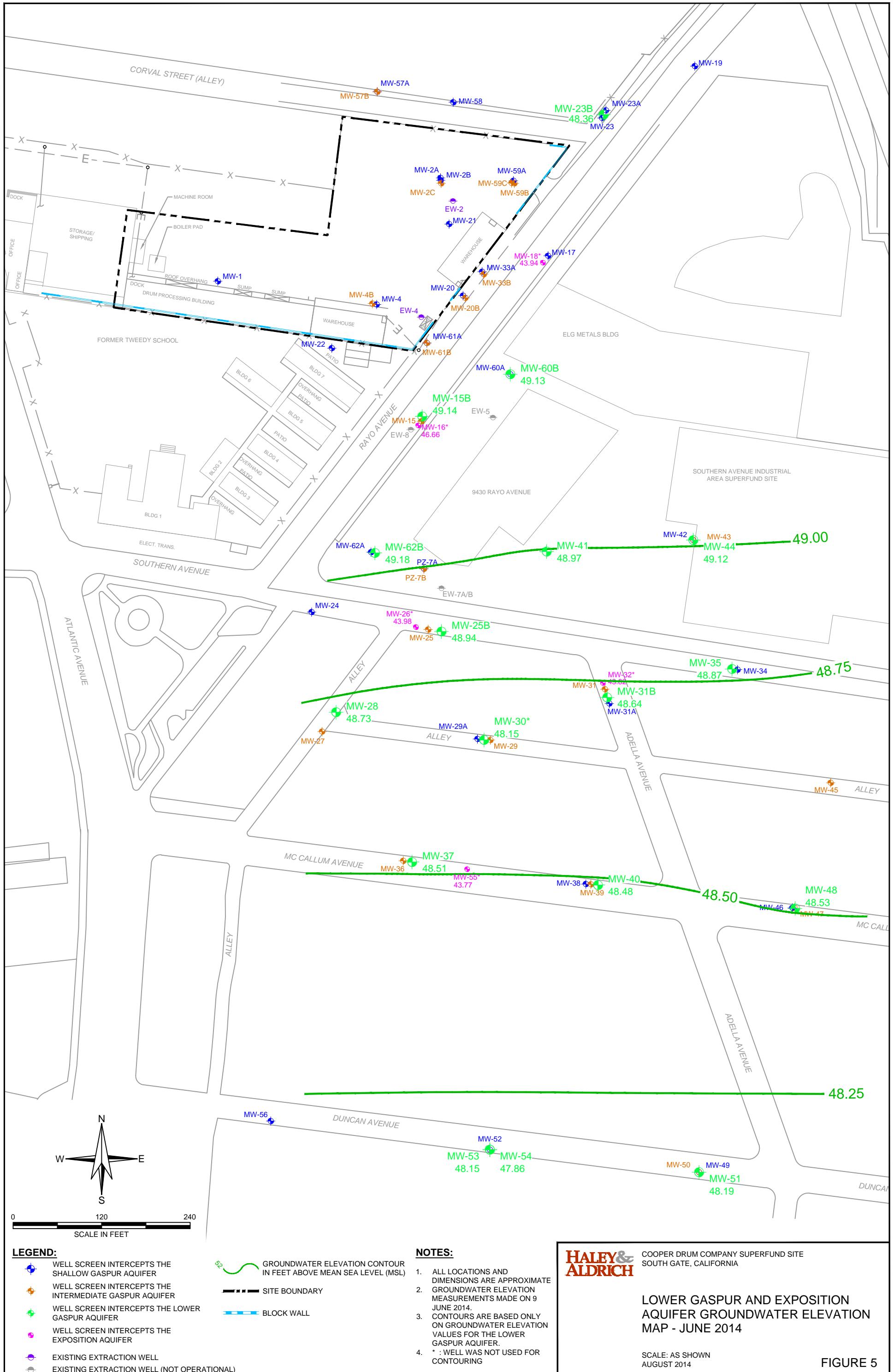




Groundwater Elevation Contour Maps, June 2014, Shallow Gaspur, Intermediate Gaspur, and Lower Gaspur and Exposition Aquifer, Cooper Drum Company Superfund Site (Haley & Aldrich, 2014)









ATTACHMENT 2

Background Information

U.S. Environmental Protection Agency (EPA) Cooper Drum Superfund Site Remedial Investigation – March 1999 and October 2000 (URS, 2002).

- Groundwater contamination beneath the Site was discovered by EPA during a remedial investigation of the adjacent Cooper Drum Superfund Site. Depth-discrete groundwater sampling results from CPT/HP borings (CPT-8 to CPT-10, CPT-20, and CPT-21) drilled on the Site to delineate the extent of the Cooper Drum Site groundwater plume indicated a groundwater plume of VOCs (trichloroethene [TCE] and cis-1,2-dichloroethene [DCE]) beneath the southeastern portion of the Site.

EPA Preliminary Assessment/Site Inspection (PA/SI) – 2002 (Weston, 2003).

- Results of the PA/SI indicated that three areas of environmental concern exist on the Site (the location of three former above-ground storage tanks [ASTs], an underground sump, and an underground storage tank [UST]). Soil and groundwater samples collected on and off the Site during the PA/SI were impacted with VOCs. The investigation indicated a release of cis-1,2-DCE and TCE to soil and groundwater beneath and downgradient from the Site, and attributed the release to past operations at the Site.

Seam Master Phase I Environmental Assessment – November 2002 (The Source Group, Inc., 2002).

- Results of this assessment, performed for the property owner (Ms. Joyce Brody), indicated that areas on the Site posed environmental concern. These areas included several sumps containing oil and water; three abandoned concrete-lined pits previously used for AST secondary containment; a UST at the southern perimeter of the Site; and an abandoned sump located south of a warehouse structure adjacent to a railroad spur along the eastern perimeter of the Site.

Site Evaluation, Seam Master Industries (Lindmark Engineering, 2007).

- This site evaluation was performed for the SAIA tenant (Seam Master Industries). The site evaluation (which included some additional soil sampling at an existing machine shop) found contamination similar to those identified in the above evaluations, and summarized/evaluated the results of previous investigations and the handling of any hazardous chemicals by Seam Master Industries.

Field activities as part of the remedial design and eventual cleanup of the Cooper Drum Superfund Site from 2003 – 2009 (URS, 2007 and ITSI, 2010).

- As part of these field activities, EPA drilled additional CPT/HP borings and installed monitoring wells on and downgradient from the Site to define the areas of plume commingling. The estimated areas of the plumes and commingling are presented in the *Remedial Design Technical Memorandum (RDTM) for Field Sampling Results Addendum No. 4, Monitoring Well Installations, Pumping Test, and Groundwater Sampling Results, April/May 2009, Cooper Drum Company Superfund Site*, (ITSI, 2010).

The 2009 well installation event included construction of four, triple-completion wells and one, single-completion well in the Gaspur Aquifer on and downgradient from the Site (MW42-44, MW-45, MW46-48, MW49-51, and MW52-54 [see Figure 1]).

CPT/HP Investigation field activities as part of the RI/FS for SAIA – March 2013 (ITSI Gilbane, 2013).

- EPA conducted a CPT/HP study to determine the most appropriate locations for the permanent wells to be installed on and downgradient from the Site. A total of 20 CPT/HP borings were installed and sampled. Eight existing wells on the property and off site also were sampled. Sample locations included upgradient (i.e., ELG Metals and Jervis Webb sites), cross-gradient, and downgradient locations (see Attachment 1, Figures A-1 and A-2). When possible, samples were collected from the perched aquifer; the shallow, intermediate, and lower zones of the Gaspur Aquifer; and the Exposition Aquifer. Detailed discussion of the sampling results is presented in the *Proposed Monitoring Well Locations, Southern Avenue Industrial Area Superfund Site, Remedial Investigation/Feasibility Study, Technical Memorandum* (ITSI Gilbane, 2013). Overall, the study found that significant VOC concentrations (>1,000 micrograms per liter [$\mu\text{g/L}$]) were present at upgradient off-site, on-site, and downgradient off-site locations, with the highest VOC concentrations detected in the Shallow Gaspur Aquifer in the southeastern portion of the Site. Significant VOC concentrations (> 1,000 $\mu\text{g/L}$) also were detected in the Intermediate and Lower Gaspur Aquifer. Samples collected from the Exposition Aquifer indicated the presence of VOCs at concentrations below the corresponding California State Water Resources Control Board (SWRCB) Maximum Contaminant Levels (MCLs), (SWRCB , 2014), with the exception of samples from SAIA-HP10 and SAIA-CPT10, which were above the MCLs. Samples collected from the perched aquifer also indicated the presence of VOCs at concentrations less than MCLs, with the exception of two on-site locations (SAIA-HP10 and -21) and one downgradient location (SAIA-CPT05), which contained VOC concentrations above MCLs.